

LISTING OF THE CLAIMS

1-22. (Cancelled)

23. (Withdrawn) A method for making an article selected from the group consisting of a component for a solid oxide fuel cell including a stabilized zirconia-containing electrolyte and a component of an oxygen sensor device including stabilized zirconia, the method comprising:

providing a ferritic stainless steel comprising greater than 25 weight percent chromium, 0.75 to less than 1.5 weight percent molybdenum, up to 0.05 weight percent carbon, and at least one of niobium, titanium and tantalum, wherein the weight percentages of niobium, titanium and tantalum satisfy the equation

$$0.4 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 1,$$

and wherein the steel has a coefficient of thermal expansion within 25 percent of the coefficient of thermal expansion of stabilized zirconia between 20°C and 1000°C, and at least one creep property selected from the group consisting of creep rupture strength of at least 1000 psi at 900°C, time to 1% creep strain of at least 100 hours at 900°C under load of 1000 psi, and time to 2% creep strain of at least 200 hours at 900°C under load of 1000 psi;

solution annealing the steel; and
processing the steel into the article .

24. (Withdrawn) The method of claim 23, wherein the article is selected from the group consisting of a separator for a solid oxide fuel cell including a stabilized zirconia-containing electrolyte and an interconnect for a solid oxide fuel cell including a stabilized zirconia-containing electrolyte.

25. (Withdrawn) An article of manufacture comprising a component including stabilized zirconia adjacent a component including a ferritic stainless steel, the steel comprising:

greater than 25 weight percent chromium;
0.75 to less than 1.5 weight percent molybdenum;

up to 0.05 weight percent carbon; and

at least one of niobium, titanium, and tantalum, wherein the weight percentages of niobium, titanium, and tantalum satisfy the equation

$$0.4 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 1,$$

wherein the steel has a coefficient of thermal expansion within about 25 percent of the coefficient of thermal expansion of the stabilized zirconia between 20°C and 1000°C, and at least one creep property selected from the group consisting of creep rupture strength of at least 1000 psi at 900°C, time to 1% creep strain of at least 100 hours at 900°C under load of 1000 psi, and time to 2% creep strain of at least 200 hours at 900°C under load of 1000 psi.

26. (Withdrawn) The article of manufacture of claim 25, wherein the coefficient of thermal expansion of the steel is at least as great as the coefficient of thermal expansion of the stabilized zirconia between 20°C and 1000°C.

27. (Withdrawn) The article of manufacture of claim 25, wherein the stabilized zirconia is yttria-stabilized zirconia.

28. (Withdrawn) The article of manufacture of claim 25, wherein the steel includes no more than 0.50 weight percent titanium.

29. (Withdrawn) The article of manufacture of claim 25, wherein the steel includes no more than 0.005 weight percent carbon.

30. (Withdrawn) The article of manufacture of claim 25, wherein the steel further comprises at least one element selected from the group consisting of up to 0.1 weight percent cerium, up to 0.05 weight percent lanthanum, and up to 0.05 weight percent zirconium.

31. (Withdrawn) The article of manufacture of claim 25, wherein the weight percentages of niobium, titanium, and tantalum in the steel satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 1.$$

32. (Withdrawn) The article of manufacture of claim 25, wherein the steel includes no more than 35 weight percent chromium.

33. (Withdrawn) The article of manufacture of claim 25, wherein the steel comprises:

25 up to 35 weight percent chromium;
0.75 to less than 1.5 weight percent molybdenum;
up to 0.005 weight percent carbon; and
at least one of niobium, titanium, and tantalum, wherein the steel includes no more than 0.50 weight percent titanium, and the weight percentages of niobium, titanium, and tantalum satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 0.75.$$

34. (Withdrawn) The article of manufacture of claim 25, wherein the article of manufacture is a component selected from the group consisting of a component for a solid oxide fuel cell including a stabilized zirconia-containing electrolyte and a component for an oxygen sensor device including stabilized zirconia.

35. (Withdrawn) The article of manufacture of claim 25, wherein the article of manufacture is selected from the group consisting of a separator for a solid oxide fuel cell including a stabilized zirconia-containing electrolyte and an interconnect for a solid oxide fuel cell including a stabilized zirconia-containing electrolyte.

36. (Currently Amended) A solid oxide fuel cell comprising:

an anode;

a cathode;

an electrolyte comprising stabilized zirconia, wherein the electrolyte is intermediate the anode and the cathode; and

an interconnect providing a current pathway from the anode, the interconnect comprising a uncoated ferritic stainless steel including

greater than 25 weight percent chromium,
0.75 up to 1.5 weight percent molybdenum,
up to 0.05 weight percent carbon, and
at least one of niobium, titanium, or tantalum, wherein the weight percentages of niobium, titanium, and tantalum satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 1,$$

wherein the steel has a coefficient of thermal expansion within about 25 percent of the coefficient of thermal expansion of stabilized zirconia between 20°C and 1000°C and exhibits at least one creep property selected from the group consisting of creep rupture strength of at least 1000 psi at 900°C, time to 1% creep strain of at least 100 hours at 900°C under load of 1000 psi, and time to 2% creep strain of at least 200 hours at 900°C under load of 1000 psi.

37. (Previously Presented) The solid oxide fuel cell of claim 36, wherein the coefficient of thermal expansion of the steel is at least as great as the coefficient of thermal expansion of stabilized zirconia between 20°C and 1000°C .

38. (Previously Presented) The solid oxide fuel cell of claim 36, wherein the coefficient of thermal expansion of the steel is at least as great as the coefficient of thermal expansion of yttria-stabilized zirconia between 20°C and 1000°C.

39. (Previously Presented) The solid oxide fuel cell of claim 36, wherein the steel comprises:

25 up to 35 weight percent chromium;

0.75 to less than 1.5 weight percent molybdenum;

up to 0.005 weight percent carbon; and

at least one of niobium, titanium, or tantalum, wherein the steel includes no more than 0.50 weight percent titanium, and the weight percentages of niobium, titanium, and tantalum satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 0.75.$$

40. (Previously Presented) The solid oxide fuel cell of claim 36, wherein the steel includes no more than 0.50 weight percent titanium.

41. (Cancelled).

42. (Previously Presented) The solid oxide fuel cell of claim 36, wherein the weight percentages of niobium, titanium and tantalum satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 0.75.$$

43. (Previously Presented) The solid oxide fuel cell of claim 36, wherein the steel includes no more than 0.50 weight percent titanium and the weight percentages of niobium, titanium, and tantalum satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 1.$$

44. (Withdrawn) The method of claim 23, wherein the weight percentages of niobium, titanium and tantalum satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 1.$$

45. (Withdrawn) The method of claim 23, wherein the weight percentages of niobium, titanium and tantalum satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 0.75.$$

46. (Withdrawn) The method of claim 23, wherein the steel includes no more than 0.50 weight percent titanium and the weight percentages of niobium, titanium, and tantalum satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 1.$$

47. (Withdrawn) The method of claim 23, wherein solution annealing the steel comprises heating the steel at a temperature that is at least the greater of the intended service temperature of the steel and 1600°F.

48. (Withdrawn) The method of claim 23, wherein the coefficient of thermal expansion of the steel is at least as great as the coefficient of thermal expansion of stabilized zirconia between 20°C and 1000°C.

49. (Withdrawn) The method of claim 23, wherein the coefficient of thermal expansion of the steel is within about 25% of the coefficient of thermal expansion of yttria-stabilized zirconia between 20°C and 1000°C.

50. (Withdrawn) The method of claim 23, wherein the steel includes no more than 0.005 weight percent carbon.

51. (Withdrawn) The method of claim 23, wherein the steel further comprises at least one element selected from the group consisting of up to 0.1 weight percent cerium, up to 0.05 weight percent lanthanum, and up to 0.05 weight percent zirconium.

52. (Withdrawn) The method of claim 23, wherein the steel includes no more than 35 weight percent chromium.

53. (Withdrawn) The article of manufacture of claim 25, wherein the weight percentages of niobium, titanium, and tantalum in the steel satisfy the equation

$$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 1.$$

54. (Withdrawn) The article of manufacture of claim 33, wherein the component is selected from the group consisting of an interconnect for a solid oxide fuel cell including a stabilized zirconia-containing electrolyte and a separator for a solid oxide fuel cell including a stabilized zirconia-containing electrolyte.